Navigation Improvement Study
Reconnaissance Report

Noank Harbor
(West Cove)
Groton, Connecticut

US Army Corps
of Engineers
New England Division

JUN 1988

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NOANK HARBOR

(WEST COVE)

GROTON, CONNECTICUT

PLAN FORMULATION

Prepared by:

Christine Johnson

Project Manager

April 1988

DESIGN AND COST ESTIMATES

Prepared by:

Pam Rubinoff

Civil Engineer

November 1987

EXISTING CONDITIONS

General Information

Noank Harbor (West Cove) is located in the town of Groton, Connecticut, south of the village of Mystic and southeast of the city of New London. The West Cove of Noank Harbor is located West of the Noank Peninsula and is bounded by Esker Point in the west and Morgan Point in the east (see Figure 1).

Land access to West Cove and vicinity is provided via U.S. Route 1, Interstate 95 and State routes 117 and 215. Direct access to West Cove is provided via state route 215. Amtrack Railway Service provides transportation to New York and Boston and is accessible from the Mystic Station. Sea access to Groton for small craft (drafts less than 7 feet) is permissible via West Cove. However, deeper draft vessels must enter either New London Harbor to the west or Mystic Harbor to the east.

As can be seen from Figure 2, besides private residences, West Cove contains a public beach area at its extreme westerly point next to Esker Point, and Spicer's Marina, located along the western part of the inner cove. In addition to its many piers and dock facilities, Spicer's Marina is responsible for the operation and maintenance of the anchorage, access channel and breakwater existing within West Cove.

West Cove is basically a recreational harbor. Only 5 commercial fishing boats are berthed in the cove. These fishing boats are located along the eastern part of the inner cove. In addition, 6 lobster boats and 4 charter boats are berthed at Spicer's Marina.

Problems and Without Project Condition

Substantial wave heights in West Cove, resulting from southwesterly gales and hurricanes have resulted in extensive damage to berthed and moored vessels, shorefront structures and backshore residences. Some specific examples resulting from Hurricane Gloria include:

1. Eight moored vessels, which were unable to seek more sheltered waters, washed ashore or sunk at their moorings.

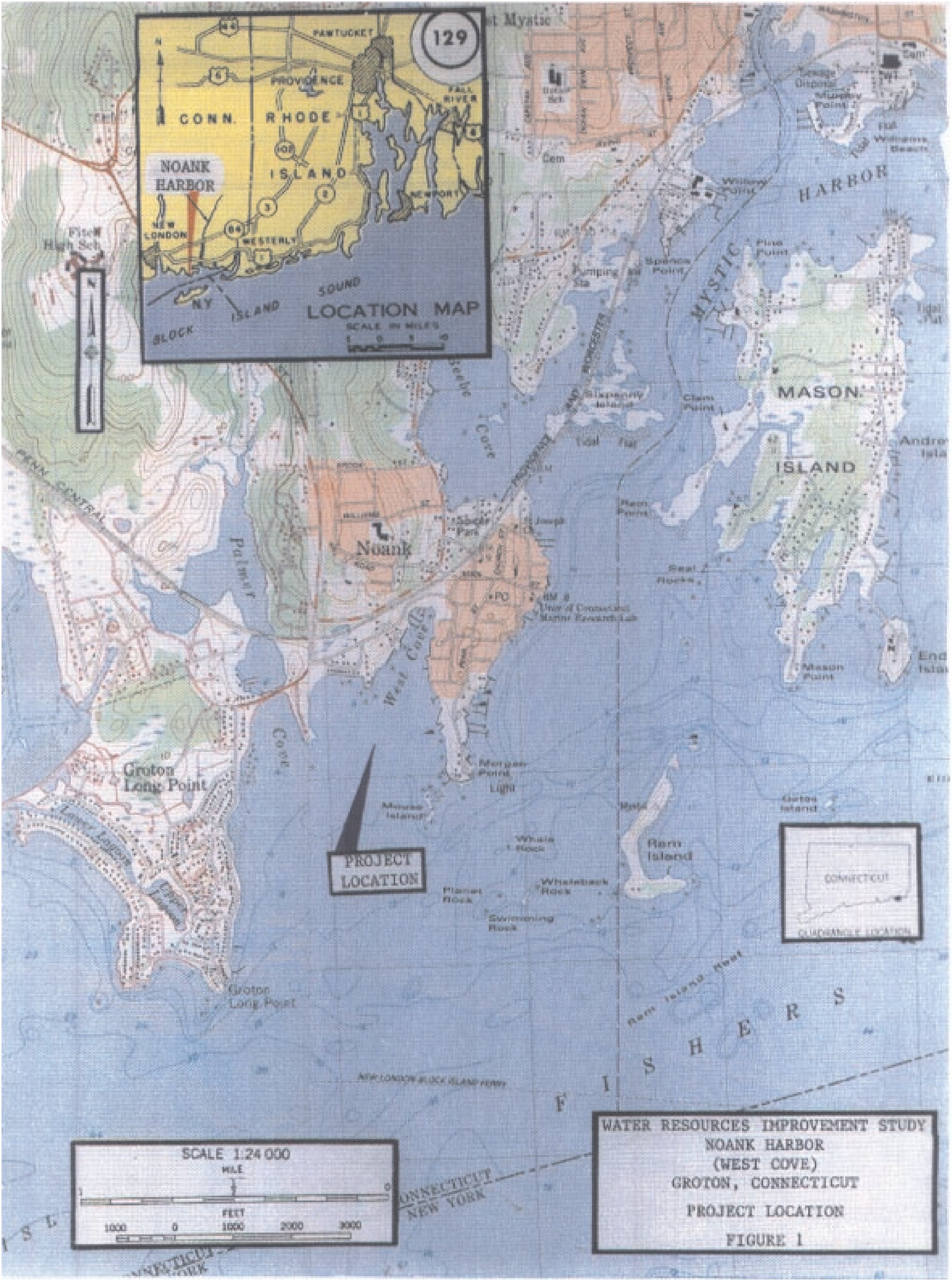
2. Four residents of the cove had to repair damage to their seawalls.

3. Six residents had to repair damage to their piers.

4. A local lobsterman had to repair his pier and building.

5. Seven vessels berthed at piers in Spicer's Marina were severely damaged.

6. One floating pier at Spicer's Marina broke free severely damaging vessels that were berthed at the pier as it washed ashore.



WATER RESOURCES IMPROVEMENT STUDY
NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT
PROJECT LOCATION
FIGURE 1

View to East towards Morgan Point - Mystic Harbor in background

View to Southwest towards Fisher's Island - Groton Long Point in background

AERIAL PHOTOGRAPHS

NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT

FIGURE 2

Photos taken September, 1986
by Mark Habel, NED

Since Hurricane Gloria, Spicer's Marina has been issued a permit from the Corps of Engineers (July 15, 1986) to construct a private breakwater to protect his piers and docking facilities. Therefore, the without project condition is assumed to be a continuation of the above problems, less damages to piers and docking facilities at Spicer's Marina (including the vessels berthed at these facilities).

OPPORTUNITIES FOR IMPROVEMENT

Plan Formulation Rationale

All of the problems described above could be reduced or eliminated by the construction of a protective structure across the mouth of West Cove.

The existing mooring basin is irregularly shaped, and is approximately 1100 feet long in the east-west direction and 2000 feet long in the north-south direction. The locally administered access channel lies due east of the mooring basin (see Figure 3). Due to the scarcity of moorings in the area, local officials requested that any protective structure not encroach on the mooring basin. Also, the structure must be adequately marked with a lighted navigation aid on its east end near the channel.

Conceptual ideas were discussed with local officials, and it was agreed that a breakwater structure extending from the vicinity of Esker Point to Mouse Island would provide optimum protection to the harbor. Local officials also indicated that the hard-packed medium grain sand, which currently supports rock along the proposed breakwater location, would also minimize settlement.

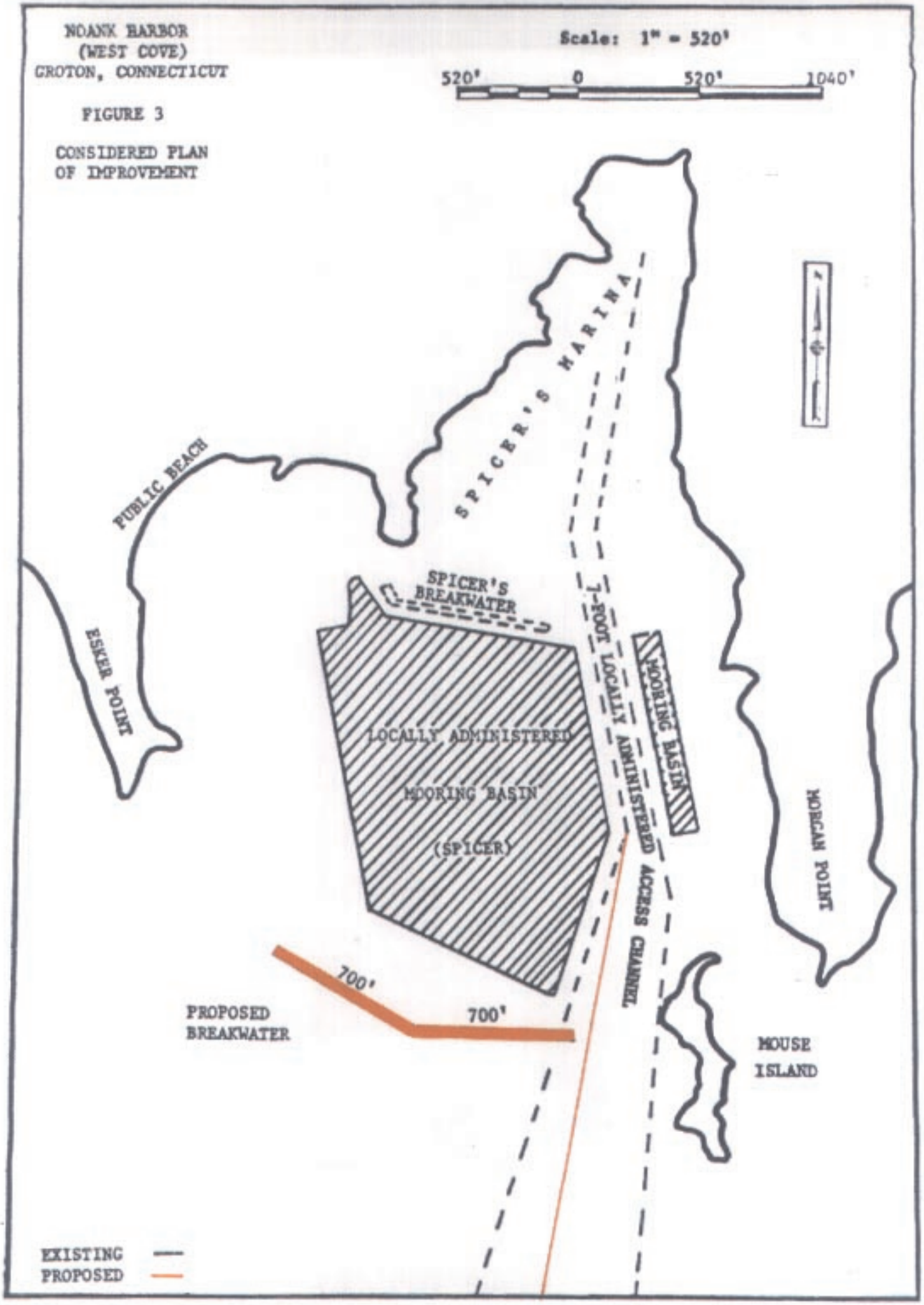
BREAKWATER ALTERNATIVES

Considered Alternatives

Both rubble-mound and concrete A-frame type breakwaters were considered. Both structures were designed to provide full protection to vessels berthed at piers, as well as, shore and backshore facilities during hurricanes. In addition, both were designed to provide full protection to moored vessels during southwesternly gales. Providing full protection to moored vessels during hurricane force storms was considered cost prohibitive.

As can be seen in Figure 3, both designs incorporate identical layouts. In order to properly protect the mooring basin, as well as shore facilities, a dogleg breakwater layout was proposed. The proposed structure would extend southeast from the vicinity of Esker point for a distance of 700 feet, and then dogleg east toward Mouse Island for a distance of 700 feet.

As requested, the mooring basin would remain unchanged. However, the existing locally administered access channel would need to be narrowed somewhat at its entrance near Mouse Island, in order for the proposed breakwater to properly protect the mooring basin.


NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT
FIGURE 3
CONSIDERED PLAN
OF IMPROVEMENT
Scale: 1" = 520'
520' 0 520' 1040'
SPICER'S MARINA
PUBLIC BEACH
SPICER'S BREAKWATER
ESKER POINT
LOCALLY ADMINISTERED
MOORING BASIN
(SPICER)
T-PIER LOCALLY ADMINISTERED
MOORING BASIN
ACCESS CHANNEL
MORGAN POINT
700'
700'
PROPOSED
BREAKWATER
MOUSE
ISLAND
EXISTING
PROPOSED

Cost of Alternatives

A wave height analysis resulted in a rubble-mound design with the cross-sectional dimensions shown in Figure 4A. The cost estimates of this alternative may be seen in Table 1. These estimates reflect November 1987 price levels for typical structures of this type.

A cross-section of the concrete A-frame design may be seen in Figure 4B. Again, this design was obtained from a wave height analysis. The cost estimates for the concrete A-frame structure may be seen in Table 2. These estimates were obtained from an AE firm from Bristol Harbor, RI in 1983, which were subsequently brought up to November 1987 price levels by the use of an Engineering Update Index.

Annual costs for both designs are shown in Table 3. It may be seen that the rubble-mound alternative, with an annual cost of $190,000, was approximately 20% cheaper than the concrete A-frame alternative, representing an annual cost of $241,000.

BENEFIT COST ANALYSIS

Annual Benefits

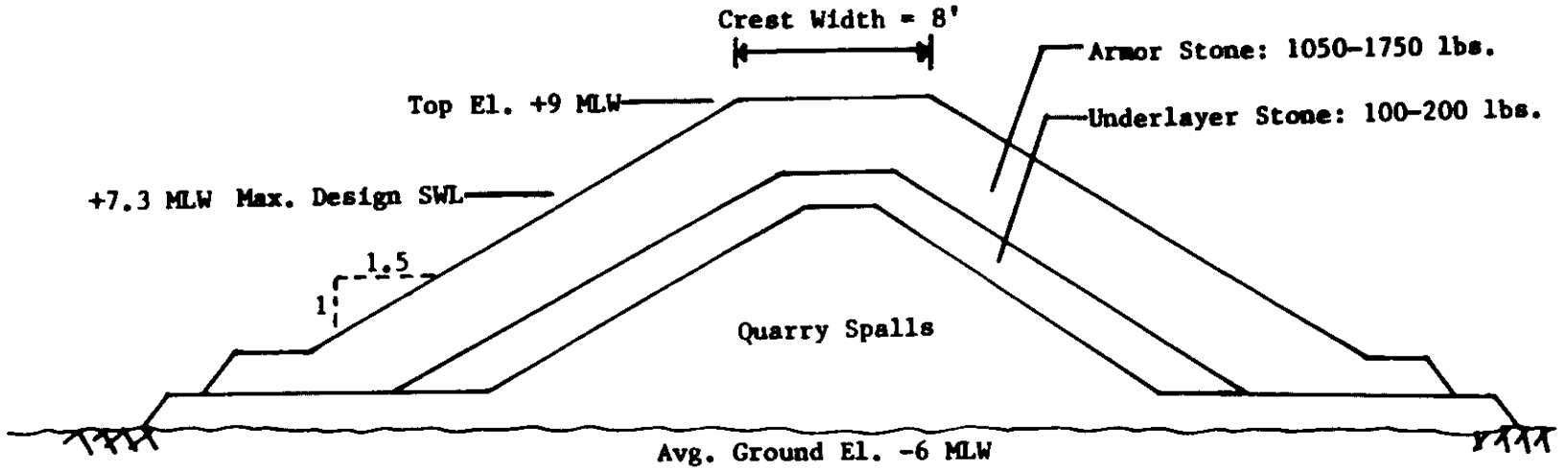
Project benefits were documented after Hurricane Gloria. Assuming the breakwater were in place, benefits include reduced damages to vessels moored and berthed within the cove, as well as, reduced damages to shore and backshore facilities. As previously mentioned, benefits do not include reduced damages to Spicer's Marina facilities nor to vessels docked at these facilities, since they are adequately protected by Spicer's breakwater.

For this project, Hurricane Gloria was assigned a 20-year frequency or a 5% probability of occurring in any given year. This frequency is the averge of a 4-year frequency tidal level and a 40-50 year frequency wind gust level in the New London (Groton) area. Therefore, the benefits documented after Hurricane Gloria were divided by 20 in order to obtain annual benefits. Benefits were based solely upon Hurricane Gloria because damages resulting from other storms were not available.

Annual benefits, as detailed in the Economics Appendix, are summarized as follows:

ANNUAL BENEFITS

Shore Facilities Damage		$ 4,000
Reduced Vessel Damage		$ 100,200
	TOTAL	$ 104,200
	SAY	$ 104,000



N.T.S.

RUBBLE-MOUND BREAKWATER DESIGN

NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT

FIGURE 4A

TABLE 1

WEST COVE, NOANK HARBOR

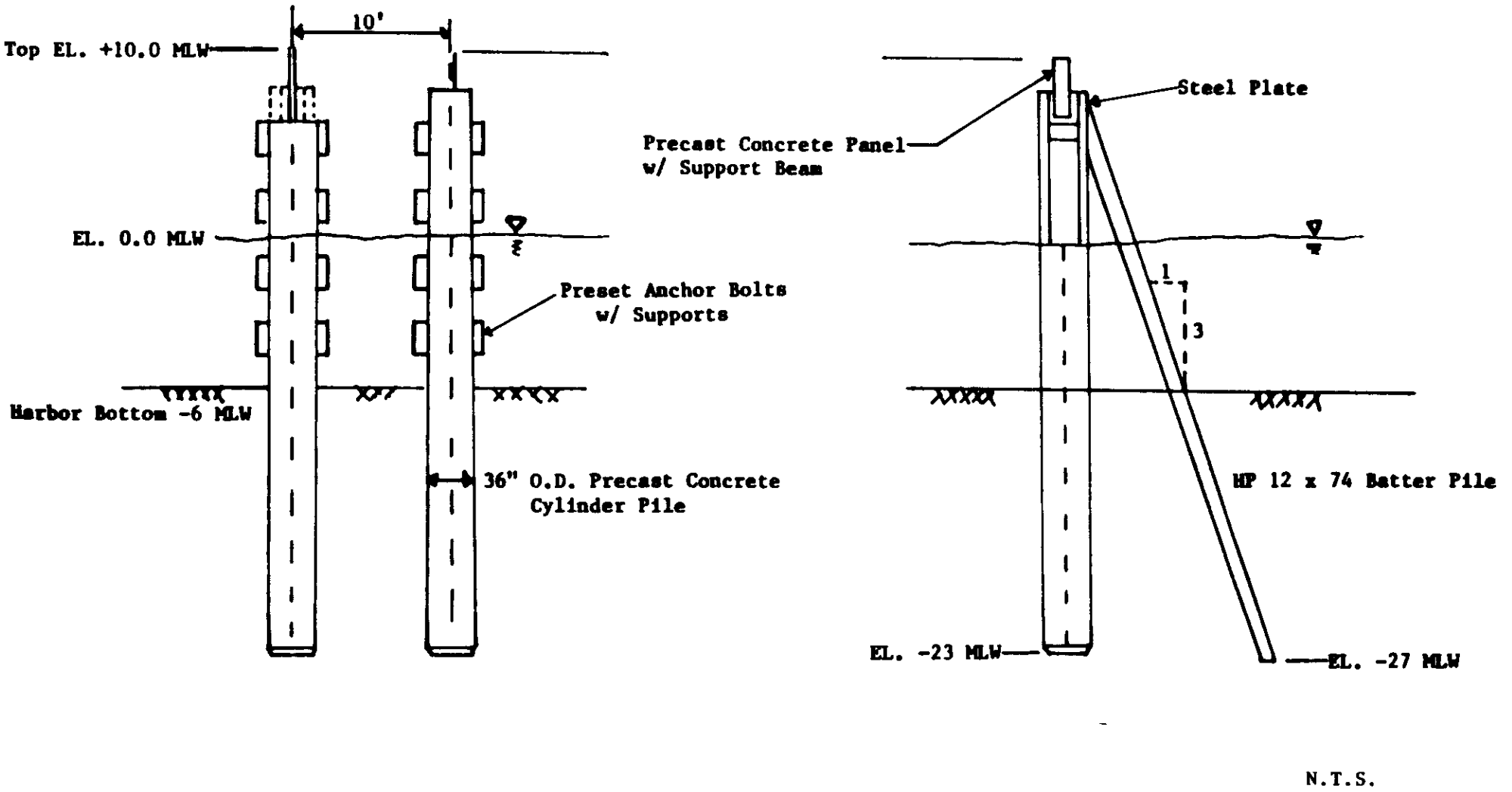
RUBBLE-MOUND BREAKWATER DESIGN

COST ESTIMATES

ITEM	QUANTITY	UNITS	UNIT PRICE(1)	TOTAL COST(2)
Stone Protection	30,000	TN	$45.00	$1,350,000
SUBTOTAL				$1,350,000
Contingency	25%			337,000
TOTAL COST OF CONSTRUCTION				$1,687,000
Engineering & Design				163,000
Supervision & Administration				163,000
TOTAL FIRST COST				$2,013,000
INTEREST DURING CONSTRUCTION (12 MONTHS) (($2,013,000 / 12 * 12.4859) - $2,013,000)				82,000
TOTAL INVESTMENT				$2,095,000
Aids to Navigation (Tower and Beacon)				14,000
TOTAL COST				$2,109,000

(1) The unit cost represents the average cost of all materials required to construct a breakwater under similar conditions. The unit cost includes mobilization/demobilization, and overhead and profit.

(2) November 1987 price level



N.T.S.

CONCRETE A-FRAME BREAKWATER DESIGN

NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT

FIGURE 4B

TABLE 2

WEST COVE, NOANK HARBOR

CONCRETE A-FRAME BREAKWATER DESIGN

COST ESTIMATES

ITEM	QUANTITY	UNITS	UNIT PRICE(1)	TOTAL COST	INDEX	UPDATED COST(2)
Mobilization/Demob	1	ls	$62,500.00	$ 62,500	1.08	$ 67,000
Concrete Piles - 36"O.D.	4512	lf	145.00	654,240	1.08	707,000
Batter Piles - HP 12 x 74	5360	lf	58.75	314,900	1.08	340,000
Batter Connection	141	ea	750.00	105,750	1.08	114,000
Coal Tar Epoxy	22400	sf	1.08	24,080	1.08	26,000
Precast Concrete Planks	825	cy	500.00	412,500	1.08	445,000
Plank Supports	141	ea	562.50	79,312	1.08	86,000
SUBTOTAL						$1,785,000
Contingency	25%					446,000
TOTAL COST OF CONSTRUCTION						$2,231,000
Engineering & Design						163,000
Supervision & Administration						163,000
TOTAL FIRST COST						$2,557,000
INTEREST DURING CONSTRUCTION (12 MONTHS) (($2,557,000 / 12 * 12.4859) - $2,557,000)						104,000
TOTAL INVESTMENT						$2,661,000
Aids to Navigation (Tower and Beacon)						14,000
TOTAL COST						$2,675,000

(1) The unit costs were obtained from a report submitted by an AE firm from Bristol Harbor, RI in September 1983. The unit costs do not include mobilization/demobilization, or overhead and profit, and therefore, they have been added separately.

(2) The updated costs were obtained by using an ENR update index, to bring the costs to a November 1987 price level.

TABLE 3

WEST COVE, NOANK HARBOR

BREAKWATER DESIGNS

ANNUAL COSTS

RUBBLE-MOUND DESIGN

Interest and Amortization $2,109,000 x 0.08765 =	$ 184,900
Breakwater Maintenance (1)	4,200
Maintenance of Navigation Aids	1,000
TOTAL	$ 190,100
SAY	$ 190,000

CONCRETE A-FRAME DESIGN

Interest and Amortization $2,675,000 x 0.08765 =	$ 234,500
Breakwater Maintenance (1)	5,600
Maintenance of Navigation Aids	1,000
TOTAL	$ 241,100
SAY	$ 241,000

(1) The annual maintenance cost is estimated to be 1/4 % of the total first cost.

Benefit Cost Analysis

Based on least cost, the rubble-mound breakwater alternative was chosen for analysis. The benefit cost analysis is shown below:

Annual Benefits	$104,000
Annual Costs	$190,000
Net Benefits	NONE
Benefit/Cost Ratio	0.55

Conclusions

The annual benefits of the considered breakwater improvement do not outweigh the annual costs. While the project is engineeringly feasible and significant environmental impacts were not identified, the lack of economic justification precludes further Federal involvement under Section 107 authority.

Recommendation

Further study of navigation improvements in the West Cove of Noank Harbor is not recommended at this time.

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NOANK HARBOR

(WEST COVE)

GROTON, CONNECTICUT

ECONOMIC ANALYSIS

Prepared by:

Marianne Matheny

Regional Economist

April 1988

ECONOMIC AND RESOURCE ANALYSIS SECTION

IMPACT ANALYSIS BRANCH

U.S. ARMY CORPS OF ENGINEERS

NEW ENGLAND DIVISION

Noank Harbor, Groton, Ct.
Reconaissance Report - Economic Analysis

Study Area

Noank Harbor (West Cove) is located in the town of Groton, Connecticut. Groton is south of the village of Mystic and southeast of the city of New London. The West Cove of Noank Harbor is located west of Noank Peninsula. The harbor has a 75 foot wide channel widening to a 200 foot fairway approaching Fisher's Island.

Existing Conditions

Noank Harbor is predominantly a recreational harbor. Spicer's Marina is located on the west side of West Cove, and accommodates 468 boats at docking facilities and at open moorings. Spicer's is currently constructing additional piers to expand docking facilities to 592 boats. A private breakwater is also being constructed by Spicer just south of the Marina, extending 780 ft. eastward from the Pennisula at the end of Noble Ave. This breakwater will protect Spicer's docks from heavy wave action during gales and hurricanes.

In addition to recreational boats, there are 6 lobster boats and 4 charter boats tied up in Spicer's Marina. There are an additional 5 or 6 lobster boats owned by residents on the eastern side of the cove, tied up at several private docks.

Because Noank Harbor opens out southward toward the sea, the harbor is extremely vulnerable to damage caused by storm wave action. Damage occurs to both shorefront structures and to moored vessels in severe storms. During Hurricane Gloria, damages occurred to several private docks, 2 marina docks, a number of seawalls, and approximately 8 moored vessels.

Plan of Improvement

The town of Groton has requested that the Corps of Engineers undertake a study to determine the economic feasibility of constructing a breakwater structure at the southern extremity of West Cove. The town officials believe that such a structure would provide adequate protection to shore and backshore facilities, and moored vessels in the harbor, against the effects of severe storms and wave action.

The breakwaters under consideration include: a concrete A-frame structure, and a rubble-mound structure. Either one would extend southeast from the vicinity of Esker point toward Mouse Island for a distance of approximately 1400 ft. The breakwater would be marked by a lighted navigation aid at its east end along the federal channel.

Economic Benefits

Benefits are estimated at the initial appraisal level, and are based on information both written and verbal, provided by The Groton Harbor Commission, Spicer's Marina, and local shorefront residents effected by the hurricane.

The without project condition takes into consideration, the damages eliminated by the breakwater constructed immediately south of Spicer's Marina. Benefits associated with a reduction in damage to vessels moored at Spicer's Marina will accrue to the private breakwater, and not to the federal project. Therefore benefits in this category will be excluded from this analysis. Estimation of damages used to calculated benefits in this analysis were documented after Hurricane Gloria, and include damage to moored boats, and shorefront structures. The difference between damages incurred without a project and any residual damages experienced after project implementation comprise the annual benefit (the net reduction in damages). The current federal interest rate of 8 5/8% was used in this analysis.

Benefit Analysis

Reduction of Damages to Shoreline Structures

Hurricane Gloria is given a 20 year frequency of occurence, or a 5% annual probability. The breakwater would be expected to reduce the maintenence on shoreline structures by 75%.

Table 1

Repairs to 4 Seawalls on Noble Ave. @15,000 ea.	$ 60,000.00
Replacement of private docks (6) $5,000 ea.	$ 30,000.00
Replacement of lobster pier and building	$ 15,000.00
Total	$105,000.00

Total damage	X	Probability	=	
$105,000.	X	.05	=	$ 5250.

Annual damage	X	Percentage of damage prevented		
$ 5250	X	.75	=	$3938. $4000.

Reduction of damage to moored vessels

A number of boats in both the mooring area and slip area of Spicer's Marina were severely damaged during the storm. A total of 15 boats were damaged together with several docks and pilings. The total damage figure for Hurricane Gloria was estimated at $3,000,000.

If the storm had occurred during August or September it is estimated that vessel damage would have been higher. In order to derive an annual damage figure per boat, this storm was used as a sample. Several boat repair facilities were surveyed in order to obtain typical damage figures for each vessel.

Golden Era Boats, the company who did most of the repairs, said that the average value of boats in the mooring area is about $30,000. Spicer's Marina quotes this value to be higher at $65,000. In this analysis the two figures have been averaged to get at a typical value of a boat completely totalled during a storm.

Golden Era Boats broke the repairs down into 3 categories: completely totalled; substantial hull and keel damage; and minor damage. They also estimated that 20% were unsalvageable, 30% received major damage and 50% received minor damage. These percentages were used to develop a weighted average of damage per vessel per year.

Damages	%		Annual Damage		Fleet Weight		
$47,000 (unsalvageable)	X .05	=	2350	X	.2	=	$470
$17,000 (major damage)	X .05	=	850	X	.3	=	255
$1,600 (minor damage)	X .05	=	80	X	.5	=	40

Total Average damage per vessel: $765

It is assumed that the breakwater will prevent 100% of damages to vessels in the mooring area.

It is further assumed that of 146 vessels that are anchored in the mooring space, 10% of them will be moved (by their owners) to avert any damages. Thus 131 (146 X .9) boats are vulnerable to damage.

Vessels		Annual Average Damage		Total Damage
131	X	$765	=	$100,215
			(rounded to	$100,200)

Table 2 - Annual Benefits

Category	$ Benefits
Reduction of Shorefront damage	4,000.
Reduction of damage to recreational vessels	100,200.
	$104,200

Project Costs

The first cost of a rubble-mound breakwater, previously described, is $ 2,109,000. The first cost of the second alternative,, an A-Frame concrete breakwater, is $ 2,675,000. These costs include contigencies, engineering and design, supervision and administration, and interest during construction.
First costs are converted to annual costs by using the capital recovery factor based on an interest rate of 8 5/8% and a project lifetime of 50 years. Maintenance of the breakwater and navigation aids are added to yield an estimated annual cost. The breakdown is illustrated below:

Table 3 - Annual Costs

Rubble-mound breakwater:

First Cost	$ 2,109,000	
Interest and Amortization (@ 8 5/8% interest)		
$ 2,109,000 x .08765		$ 184,900
Breakwater Maintenance		4,200
Maintenance of Navigation Aids		1,000
Total		$ 190,100
	rounded to:	$ 190,000

A-Frame Concrete Breakwater:

First Cost	$ 2,675,000	
Interest and Amortization		
$ 2,675,000 x .08765		$ 234,500
Breakwater Maintenance		5,600
Maintenance of Navigation Aids		1,000
Total		$ 241,100
	rounded to:	$ 241,000

Economic Evaluation

In order for a proposed project to be considered economically justified, and therefore eligible for federal participation, the benefit cost ratio must be equal to 1 or greater. The table below compares the annual benefits with the annual costs.
The rubblemound breakwater has a benefit-cost ratio of .23, and the concrete A-Frame breakwater has a benefit-cost ratio of .18. Both proposed alternatives are therefore not economically justified.

Table 4 - Economic Summary

	Annual Benefit	Annual Costs	Benefit Cost - Ratio	Net Benefits
Rubble-mound Breakwater	$104,200	$ 190,000	.55	Negative
A-Frame Concrete Breakwater	$104,200	$ 241,000	.43	Negative

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NOANK HARBOR

(WEST COVE)

GROTON, CONNECTICUT

ENVIRONMENTAL CONCERNS

Prepared by:

Michael Penko

Biologist

November 1987

ENVIRONMENTAL RESOURCE SECTION

IMPACT ANALYSIS BRANCH

U.S. ARMY CORPS OF ENGINEERS

NEW ENGLAND DIVISION

RECONNAISSANCE REPORT FOR A PROPOSED SECTION 107 HARBOR PROTECTION PROJECT AT NOANK HARBOR, GROTON CONNECTICUT.

A. Professional Observations:

The proposed project entails the construction of a breakwater in Noank Harbor. Preliminary plans call for the proposed breakwater to extend across the mouth of West Cove from the vicinity of Esker Point to Mouse Island.

On October 7, 1987 the planning team (Christine Johnson, Marianne Matheny, and Michael Penko) met on site with Mr. Paul Bates (Chairman, Groton Harbor Management Commission) and Mr. Robert Hust (Planning Dept., Town of Groton).

Local officials indicated that a significant shellfish (clam) resource exists in the West Cove area. Extensive eelgrass (Zostera marina) beds also reportedly exist in the cove. Much of the cove is presently closed to shellfish harvesting because of poor water quality. Reported quahog densities in the cove range from 0.5 to 0.8 individuals per square foot (Pratt and Logee 1984; Burke and Swenarton 1985).

Grab samples were taken from a boat at three locations along the proposed breakwater. Several grabs were taken at each location. All locations were subtidal. Water depth was approximately 8 feet (at high tide). All samples contained Zostera . Plants appeared healthy, and were producing vigorous new rhizomes. The substrate apparemtly consisted of hard packed, medium grain sand. Cursory inspection of grab samples in the field revealed no clams or other shellfish. A grab sample was also taken from a location near the Esker Point Beach. Zostera was also found at this location, but the substrate was soft and silty. Local officials indicated that the inner cove is experiencing siltation problems and undesirable Zostera growth near the beach. Benthic samples were returned to NED and archived.

It appears likely that the breakwater could significantly affect sediment deposition/removal patterns at the Esker Point beach and within the inner harbor. Altered currents and sedimentation patterns could have a deleterious effect on filter feeding invertebrates (including shellfish) and on Zostera. A detailed investigation of breakwater effects on currents and sedimentation patterns should be performed in subsequent study phases.

The local marina (Spicer's Marina) is undertaking an aggressive harbor expansion program. New docks are planned and a rock breakwater is under construction. The rock breakwater is located between the docks and the breakwater proposed by NED. Dredging in the navigation channel and dock area has occurred during the last several years. Some controversy exists because contractors apparently failed to relocate clam resources prior to dredging, as requested by the Connecticut DEP.

A more detailed reconnaissance effort was not expended because preliminary economic analysis indicated that the project was not viable. Followup work concerning natural resources at the site would include a more vigorous sampling effort, and coordination with local, state, and federal agencies. Local scallop fisherman and the staff of the University of Connecticut Marine Research Lab (Noank) would also be contacted. An EA written for the the Spicer Marina breakwater would be consulted.

In conclusion, it appears that the project has the potential to impact significant Zostera and shellfish resources. Potential impacts include the permanent loss of some benthic habitat, and the possible effect of altered current/sedimentation patterns on the marine subtidal community. If future studies were to confirm the existence of significant shellfish or Zostera resources, project plans would include a detailed discussion of mitigation measures.

B. References:

Burke, R.M. and J.T. Swenarton 1985. A Shellfish Survey of West Cove, Noank, Connecticut, with Reference to Spicer's Marina Expansion Application no. SD-H-85-153. Illicium Oceanographic Research. Stonington, CT.

Pratt, S.D. and M.A. Logee. 1984. Survey of bottom animals from West Cove, Noank, Connecticut. In: An analysis of the proposed Spicer's Marina construction and dredging in West Cove." by R.C. Kollmeyer. Oceanographic Studies Inc. Groton, Connecticut.

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NOANK HARBOR

(WEST COVE)

GROTON, CONNECTICUT

PERTINENT CORRESPONDENCE

April 1988

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

June 30, 1988

CENEDPL-CN (1105-2-10)

MEMORANDUM FOR: Commander, USACE (CECW-P), 20 Mass. Ave., N.W.
Washington, D.C. 20314-1000

SUBJECT: Reconnaissance Report, Noank Harbor (West Cove), Groton, Connecticut - CWIS No. 87563 (2nd Congressional District)

1. A Reconnaissance Report for the subject project, prepared under the authority of Section 107 of the Rivers and Harbor Act 1960, as amended, has been completed. Federal assistance was requested by Paul Bates, Chairman of the town of Groton Harbor Management Commission, in a letter dated 7 March 1986 (copy of letter enclosed).

2. Ten copies of the subject report and Fact sheet are attached. The report recommends no further study, based on insufficient economic justification. The study sponsor has been informed of our findings (copy of letter enclosed).

FOR THE COMMANDER:

THOMAS A. RHEN
Colonel, Corps of Engineers
Commanding

Enclosure

CONTINUING AUTHORITIES FACT SHEET
NOANK HARBOR
RECONNAISSANCE REPORT

June 1988
New England Division

1. Project: West Cove
Noank Harbor
Groton, Connecticut
CWIS: 87563

States: Connecticut
County: New London
Congressional District: 2nd

2. Authority: Section 107 of the 1960 River and Harbor Act, as amended, for Small Navigation Projects.

3. Location of Study Area: As shown in Figure 1, Noank Harbor (West Cove) is located in the town of Groton, south of the village of Mystic and southeast of the city of New London. The West Cove of Noank Harbor is located West of the Noank peninsula and is bounded by Esker Point in the west and Morgan Point in the east.

4. Dates of Corps Action: The Reconnassiance Study was initiated on 27 March 1986 in response to a letter from the Groton Harbor Commission dated 7 March 1986. The Groton Town Manager specifically requested investigation of the proposed improvements under Section 107 authority in a letter dated 23 April 1986. Copies of these letters and other pertinent correspondence are attached.

5. Problems, Needs and Opportunities Identified: Substantial wave heights resulting from southwesternly gales and hurricanes have resulted in extensive damage to berthed and moored vessels, shorefront structures and back-shore residences. The specific problems identified by the Groton Harbor Commission and local interests, and substantiated by NED are the following:

a) While most moored vessels seek more sheltered waters during major storms, many small craft owners are unable to relocate their vessels in time. During Hurricane Gloria, many small craft were washed ashore, while others were sunk at their moorings. Vessels berthed at the harbor's piers also experienced extensive damage.

b) Wave action resulting from major events causes substantial damage to shorefront, as well as, backshore facilities. As a result of Hurricane Gloria, four residents of West Cove had to repair damage to their seawalls, six residents had to repair their piers, and Spicer's Marina had to rebuild a pier that was severely damaged when it broke free and washed ashore.

The local sponsor's perception of need arising from these problems is for a protective structure across the mouth of Noank Harbor's West Cove.

6. Alternative Plans Considered: Both structural and nonstructural options were considered for protecting West Cove from wave action. Nonstructural options, such as the permanent transfer of the fleet to a more protected location were unacceptable to the sponsor. Therefore, structural options, namely rubble-mound and concrete A-frame breakwater alternatives, were examined.

7. Description of Recommended Plan: No Recommended Plan Exists.

Both rubble-mound and concrete A-frame breakwater alternatives were considered. Regardless of type, the considered breakwater would separate outer West Cove from Fisher's Island Sound. The structure would extend southeast from the vicinity of Esker Point for a distance of 700 feet, then dogleg east toward Mouse Island for a distance of 700 feet. The structure would be detached at both ends, thereby providing efficient tidal flushing of the cove, and would be marked by a lighted navigation aid at its east end near the access channel. The locally administered channel would remain at its present location due west of Mouse Island. However, as may be seen in Figure 2, the westernly limit of the channel would need to be narrowed somewhat at its entrance near Mouse Island, in order for the proposed breakwater to properly protect the mooring basin.

Either the rubble-mound or the concrete A-frame breakwater alternative could be constructed to provide complete protection from all but the most severe storms, which would overtop the structure. However, neither of the considered plans is economically justified.

Based on least cost, the concrete A-frame breakwater alternative was chosen for financial analysis. Table 1 presents the costs, benefits, and financial data concerning the plan. As can be seen from the table, the considered plan in not economically justified, and therefore, no recommended plan exists.

8. Views of Sponsor: The town of Groton through its Harbor Management Commission is the study/project sponsor. Both of the considered plans described above fit the sponsor's needs for harbor protection and are compatible with the local harbor management plan and community master plan.

9. Views of Federal, State and Regional Agencies: Since neither of the considered plans, rubble-mound or concrete A-frame, could be economically justified, no formal coordination was initiated. However, coordination with resource agencies concerning conceptual schemes indicated that benthic resources, siltation buildup and water quality within the harbor were the primary concerns, should further studies be considered.

10. NED PLAN: There is no NED Plan. Neither of the Considered Plans are recommended as a basis for further study.

11. Status of NEPA Document: N/A

12. Significant Effects: N/A

13. Implementation Schedule: N/A

14. Supplemental Information: NONE

15. OCE Review: N/A

TABLE 1
NOANK HARBOR
CONTINUING AUTHORITIES FACT SHEET
RECONNAISSANCE REPORT

ECONOMIC AND FINANCIAL DATA
CONSIDERED PLAN
(NOT RECOMMENDED)

Estimated Implementation Costs:
(Nov. 1987 price levels)

Federal - Initial	$1,060,000
Federal - Ultimate	Same
U.S. Coast Guard	$14,000
Non-Federal - Initial	1,035,000
Non-Federal - Ultimate	Same
TOTAL	$2,109,000

Economic Data:
(8 5/8%, 50 year life)

Annual Charges: $190,000
(Includes $4,200 OM&R)
Federal (OM&R) NONE
Annual Benefits: $104,000

BCR: 0.55

Non-Federal Requirements: 49.4% *Cash contribution towards construction. 100 percent of OM&R costs estimated at $4,200 on an annual basis.

* (96.2 x 0.50) + (3.8 x 0.35) = 49.4%

Cost Allocation:

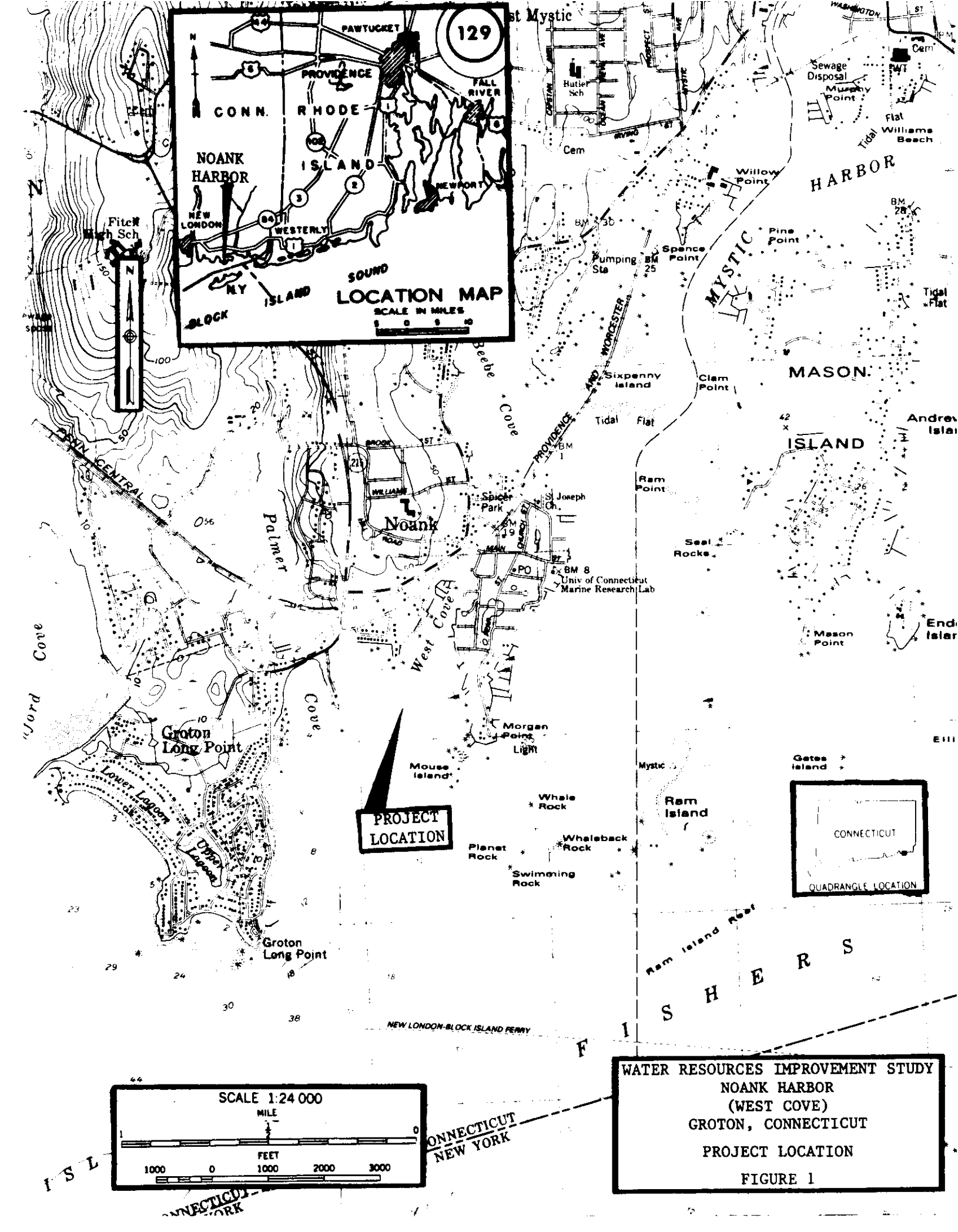
	Federal	Non-Federal	Avg Ann. Benefits
Recreational Nav.	$1,060,000(50.6%)	$1,035,000(49.4%)	$100,200(96.2%)
Backshore & Shorefront Protection	JOINT	JOINT	4,000(3.8%)
TOTAL	$1,060,000	$1,035,000	$104,200

Allocations to Date:

	Federal	Non-Federal
Reconnaissance	$9,000	None

Remaining Requirements:

No further study recommended.



WATER RESOURCES IMPROVEMENT STUDY
NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT

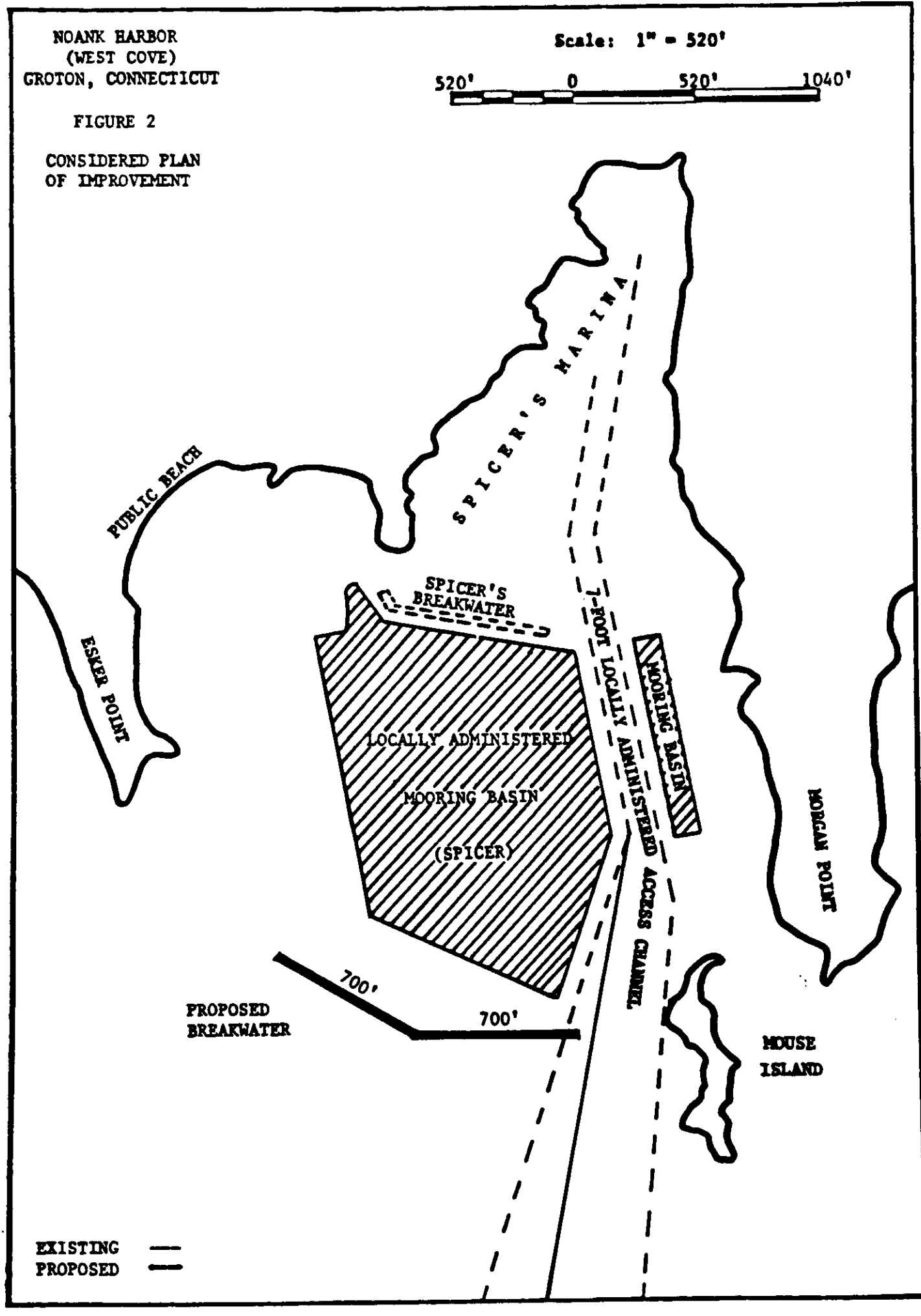
PROJECT LOCATION

FIGURE 1

NOANK HARBOR
(WEST COVE)
GROTON, CONNECTICUT

FIGURE 2

CONSIDERED PLAN
OF IMPROVEMENT



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

June 30, 1988

Planning Division
Coastal Development Branch

Honorable Eric Robba
Mayor of the town of Groton
45 Fort Hill Road
Groton, Connecticut 06340

Dear Mayor Robba:

The New England Division has completed its Reconnaissance Study of the proposed breakwater in Noank Harbor (West Cove), Groton, Connecticut, conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended. The attached Reconnaissance Report concludes that further Federal study of this project is not warranted due to insufficient economic justification.

The study evaluated the costs and impacts of two breakwater designs, rubble-mound and concrete A-frame. Both structures were designed to provide full protection to vessels berthed at piers, as well as, shore and backshore facilities during hurricanes. In addition, both structures were designed to provide full protection to moored vessels during southwesterly gales. Providing full protection to moored vessels during hurricane force storms was considered cost-prohibitive. At a cost of about $2,109,000, the rubble-mound design was the least expensive. However, annual benefits of $104,000 did not outweigh annual costs of $190,000.

Should you have any questions concerning our report, please feel free to contact me at (617) 647-8220, or the Project Manager, Mark Habel, of my staff, at (617) 647-8550.

Sincerely,

Thomas A. Rhen
Colonel, Corps of Engineers
Division Engineer

Town of Groton

45 FORT HILL ROAD • GROTON, CONNECTICUT 06340 TEL. 203 445-8551

April 23, 1986

Colonel Thomas A. Rhen
Division Engineer
New England Division, Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02254-9149

Dear Colonel Rhen:

SUBJECT: Noank Harbor, Groton, Connecticut
Request for Small Navigation Project
per Section 107 of the 1960 Rivers
and Harbors Act as Amended

At the April 15, 1985, Town of Groton Council meeting it was voted to request that in accordance with the provisions of Section 107 of the Rivers and Harbors Act of July 14, 1960, as amended, the Army Corps of Engineers investigate necessary improvements to the Noank Harbor, Groton.

Upon completion of the first study phase the Town will expect to receive a report before proceeding to the second phase. It should be understood that the Groton Town Council makes no commitment with regard to sharing in funding of any improvements which might be recommended as a result of the studies. With various other requirements facing the Town in the next several years, funding for a project of this type could not be considered a priority.

Sincerely yours,

C. Richard Foote

C. Richard Foote
Town Manager

CRF:mw
cc: Mayor Robba
Robert Hust
Paul Bates

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

March 27, 1986

REPLY TO ATTENTION OF
Planning Division
Coastal Development Branch

C. Richard Foote
Town Manager
45 Fort Hill Road
Groton, Connecticut 06340

Dear Mr. Foote:

I am pleased to inform you that we have initiated a small navigation improvement study for Noank Harbor, Groton, Connecticut in response to a letter from your Harbor Management Commission dated 7 March 1986.

The first step will involve making an initial appraisal to determine if further study of providing navigation improvements at Noank Harbor, Groton, Connecticut is warranted. You will be notified of our findings upon completion of the initial appraisal.

Should you have any questions, please contact the Project Manager, Mr. Ray Korber, at (617) 647-8520.

Sincerely,

Thomas A. Rhen
Colonel, Corps of Engineers
Division Engineer

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

March 27, 1986

REPLY TO ATTENTION OF
Planning Division
Coastal Development Branch

Honorable Samuel Gejdenson
House of Representatives
Washington, D.C. 20515

Dear Mr. Gejdenson:

This is in regard to your letter of March 18, 1986, in which you forwarded a request from the town of Groton, Connecticut, for the Corps of Engineers to undertake a preliminary study for constructing a breakwater to protect Noank Harbor.

We have contacted the appropriate town officials, and are in the process of scheduling a meeting with them to discuss their navigational improvement needs. We have also opened a revolving fund account to conduct an Initial Appraisal study to determine the appropriate response to meet these needs. The Initial Appraisal study will be conducted under the authority and provisions of Secton 107 of the 1960 River and Harbor Act, as amended.

If you have any questions concerning the study, please contact me at (617) 647-8220 or have your staff contact the Project Manager, Mr. Ray Korber, at (617) 647-8520.

Sincerely,

Thomas A. Rhen
Colonel, Corps of Engineers
Division Engineer

Copy furnished:

Honorable Samuel Gejdenson
Representative in Congress
Box 2000
Norwich, Connecticut 06360

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO ATTENTION OF
NEDPL-C

27 March 1986

SUBJECT: Section 107 Initial Appraisal for
Noank Harbor, Groton, CT

CDR USACE (DAEN-CWP-E)
20 Mass. Ave., N.W.
Washington, D.C. 20314-1000

1. We have recently received a request asking for the initiation of a small navigation improvement study pursuant to Section 107 of the 1960 River and Harbor Act. The formal request is as follows:

Groton, CT - Letter dated 7 Mar 1986 from the town of Groton requesting improvements to navigation in Noank Harbor. A copy of the letter is enclosed.

2. A revolving fund account in the amount of $7,500 has been set up for the completion of the initial appraisal to determine the need for a full scope Section 107 Reconnaissance and Detailed Project Study. Town officials are being notified of the establishment of the study fund account and that work will be initiated as soon as capability allows.

THOMAS A. RHEN
Colonel, Corps of Engineers
Commanding

Enclosure

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

SAM GEJDENSON
2d District
Connecticut

Committees
Foreign Affairs
Interior

March 18, 1986

Colonel Thomas A. Wren
Department of the Army,
Corps of Engineers
424 Trapelo Road
Waltham, Ma. 02254

Dear Colonel Wren:

I am forwarding a request from the Town of Groton Harbor Management Commission concerning a breakwater at the mouth of the Mystic River.

Enclosed also are two maps which detail the area in question.

Thank you for your consideration.

Sincerely,

SAM GEJDENSON
Member of Congress

SG/js/bw

Washington Office:
1404 Longworth Building
Washington, D.C. 20515
(202) 225-3976

Norwich Office:
P.O. Box 2689
Norwich, Connecticut 06360
(203) 886-0139

Middletown Office:
94 Court Street
Middletown, Connecticut 06457
(203) 346-1125

Town of Groton

45 FORT HILL ROAD • GROTON, CONNECTICUT 06340 TEL. 203 445-8551

March 7, 1986

Representative Samuel Gejdenson
P.O. Box 2000
Norwich, Connecticut 06360

Dear Mr. Gejdenson:

SUBJECT: Preliminary Study for Breakwater Structure at Noank Harbor, Groton, Connecticut

In light of the recent coastal damage caused by Hurricane Gloria, concern over harbor protection from such storms has risen significantly. It has come to our attention that the Army Corps of Engineers does undertake preliminary studies of the needs and benefits of Breakwater Structures designed to protect life and property. The Harbor Management Commission asks that you request the Army Corps to undertake such a study for a breakwater at the southern extremity of West Cove at the mouth of the Mystic River. Such a structure would provide refuge and safety for commercial fishermen, shorefront property, recreational craft, and would protect a transient anchorage area. Attached is a location map and sketch of the potential structure. The person to contact at the Army Corps concerning such a study is:

Colonel Thomas A. Rhen Wren
Department of the Army, Corps of Engineers
424 Trapelo Road
Waltham, Massachussetts 02254

If you have any questions concerning this letter, please do not hesitate to contact me.

Sincerely,

Paul Bates

Paul Bates, Chairman
Town of Groton Harbor Management Commission

PB:as
cc: Colonel Hammond, Army Corps
Mayor Eric Robba
Arthur Rocque Jr., CAM